Energy for Sustainable Development in Africa: Successes, Challenges and the way forward

Ackom, Emmanuel; Haselip, James Arthur; Mackenzie, Gordon A.

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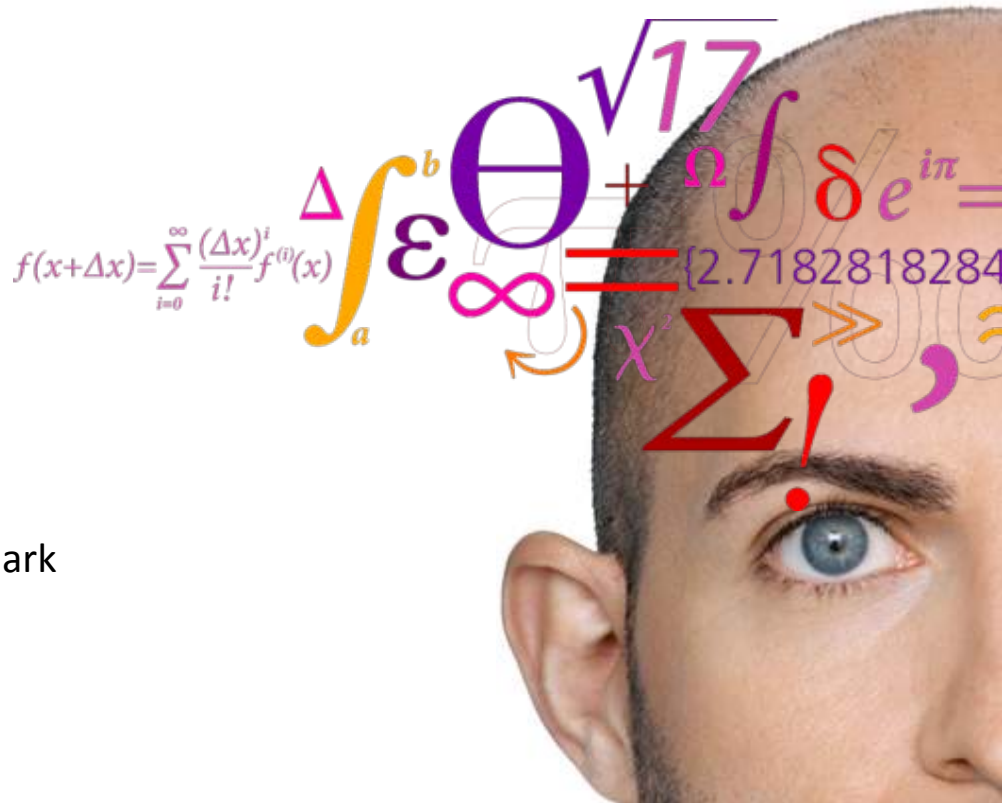
Energy for Sustainable Development in Africa: Successes, Challenges and the way forward

Emmanuel Ackom, PhD
James Haselip, PhD,
Gordon Mackenzie, PhD

Senior Scientist
UNEP DTU Partnership
DTU Management Engineering
UN City Campus, Copenhagen, Denmark



Presentation, 2017

Outline

UN City, Copenhagen

- Background of UNEP DTU Partnership (UDP)
- Why Energy for SD?
- Africa is rich in energy resource, yet poor in energy access – 'The 66% issue'
- Investment required and # of jobs
- Country case examples (based on some success stories)
- Challenges for Energy for SD in Africa
- Suggestions on way forward (for possible consideration)

UNEP DTU Partnership (UDP)

UN City/FN Byen in Nordhavn, Copenhagen

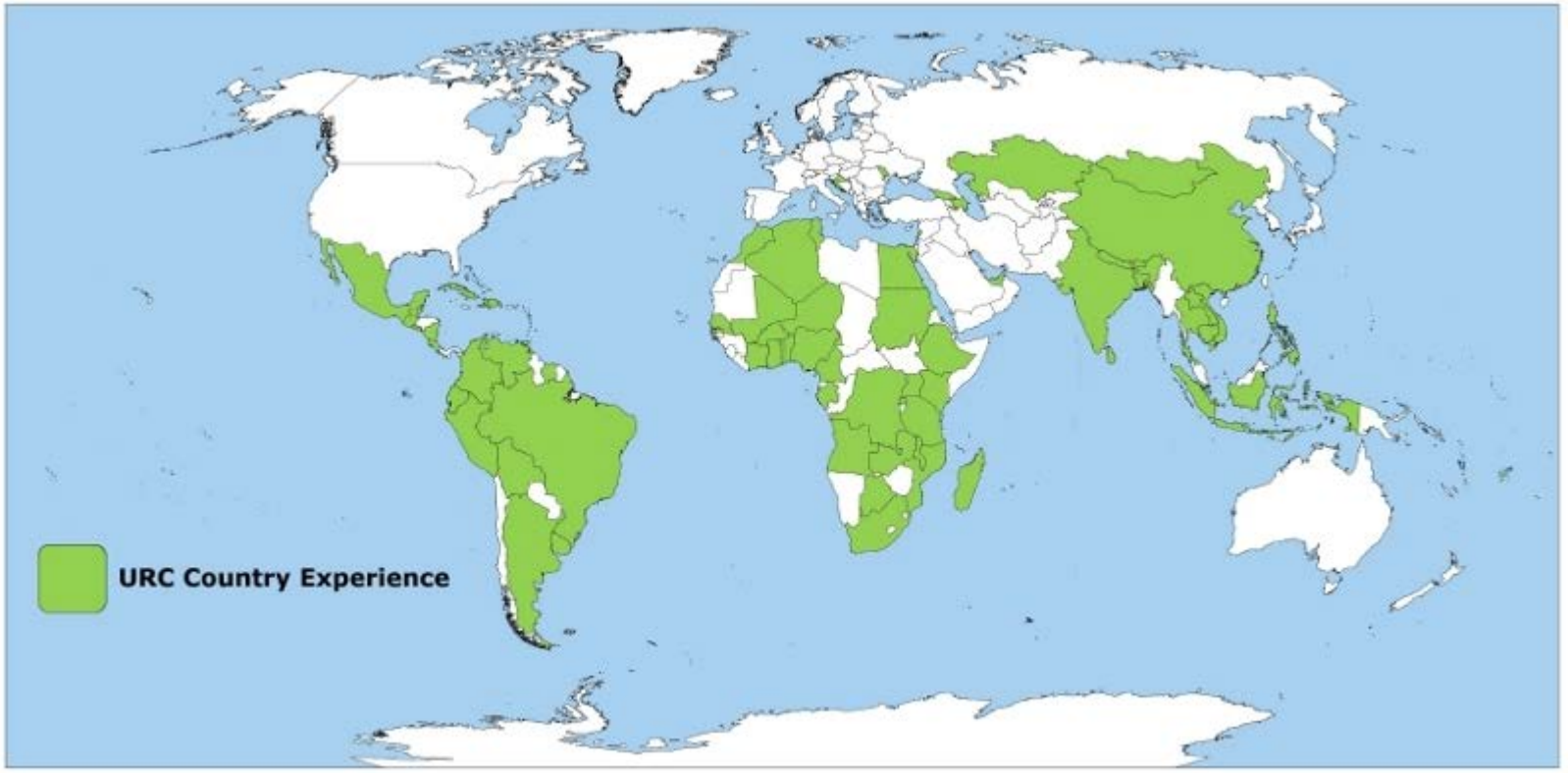
UDP was established in 1990 as an independent unit based on an agreement between **UNEP, DTU** and **The Danish Ministry of Foreign Affairs**

General mandate is to support and promote **UNEP activities** in the areas of **energy and climate change**, with a **special emphasis on developing countries**.

Special setting of UNEP DTU

- Integrated part of UNEP with a core research budget
- >65 economists and scientists from >20 different nations
- Access to a broad range of energy scientists and specialists at DTU
- A wide network of collaborating institutions, NGO's and partners in more than 50 developing countries
- A non profit public institution with high demands to procedures, transparency and accounting

UNEP DTU Partnership Country Experience



Which of these should have the highest priority?

- Access to **modern energy services** i.e. lighting, cooking etc
- **Food security**
- **Water**
- **Health**
- **Jobs**
- **Gender equity**

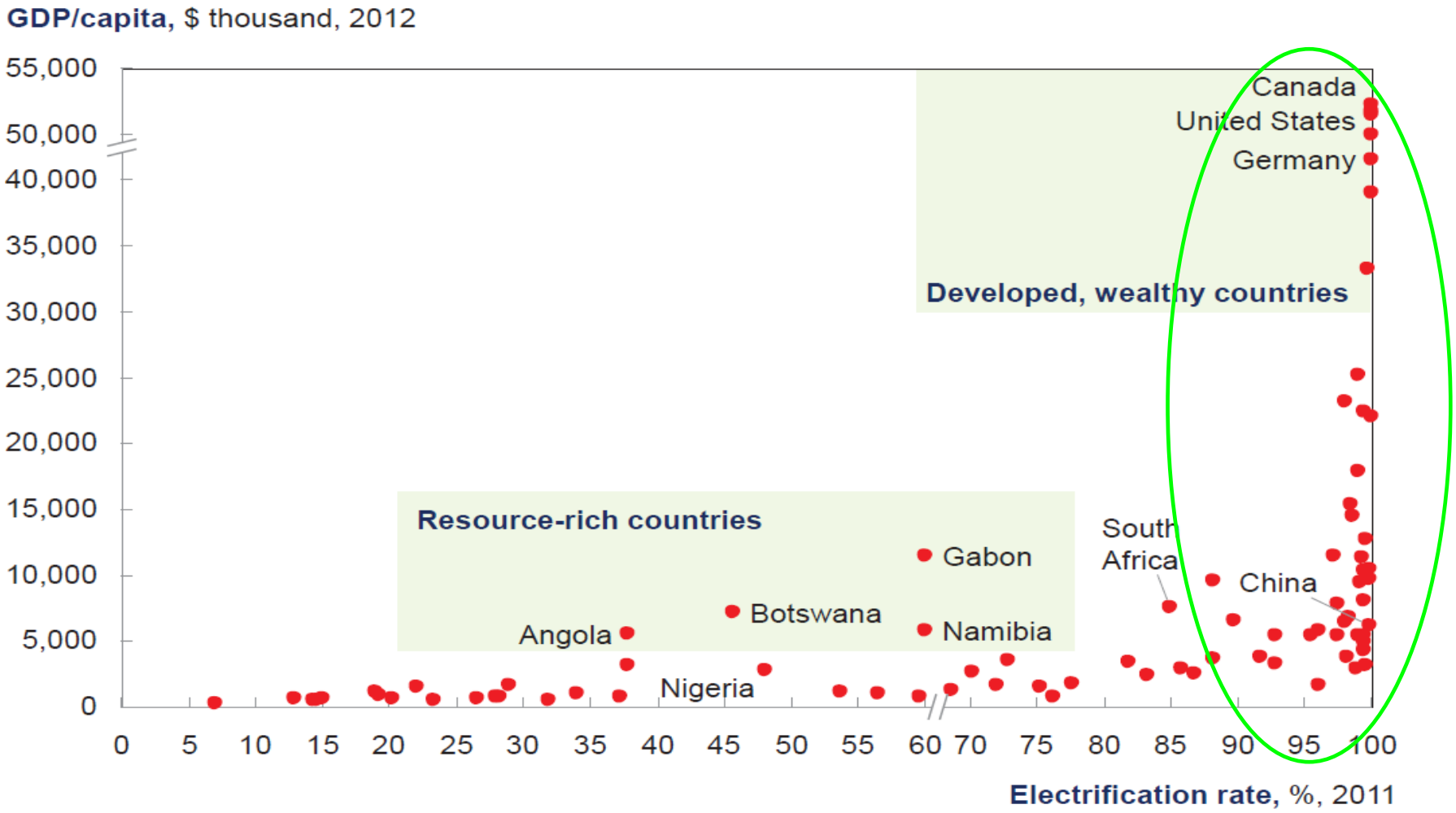
Source:www.archive-india.org

Answer: they are all very important

However **ENERGY** stands out as an enabler for the rest (WB, 2017)

ENERGY: SDGs Multiplier

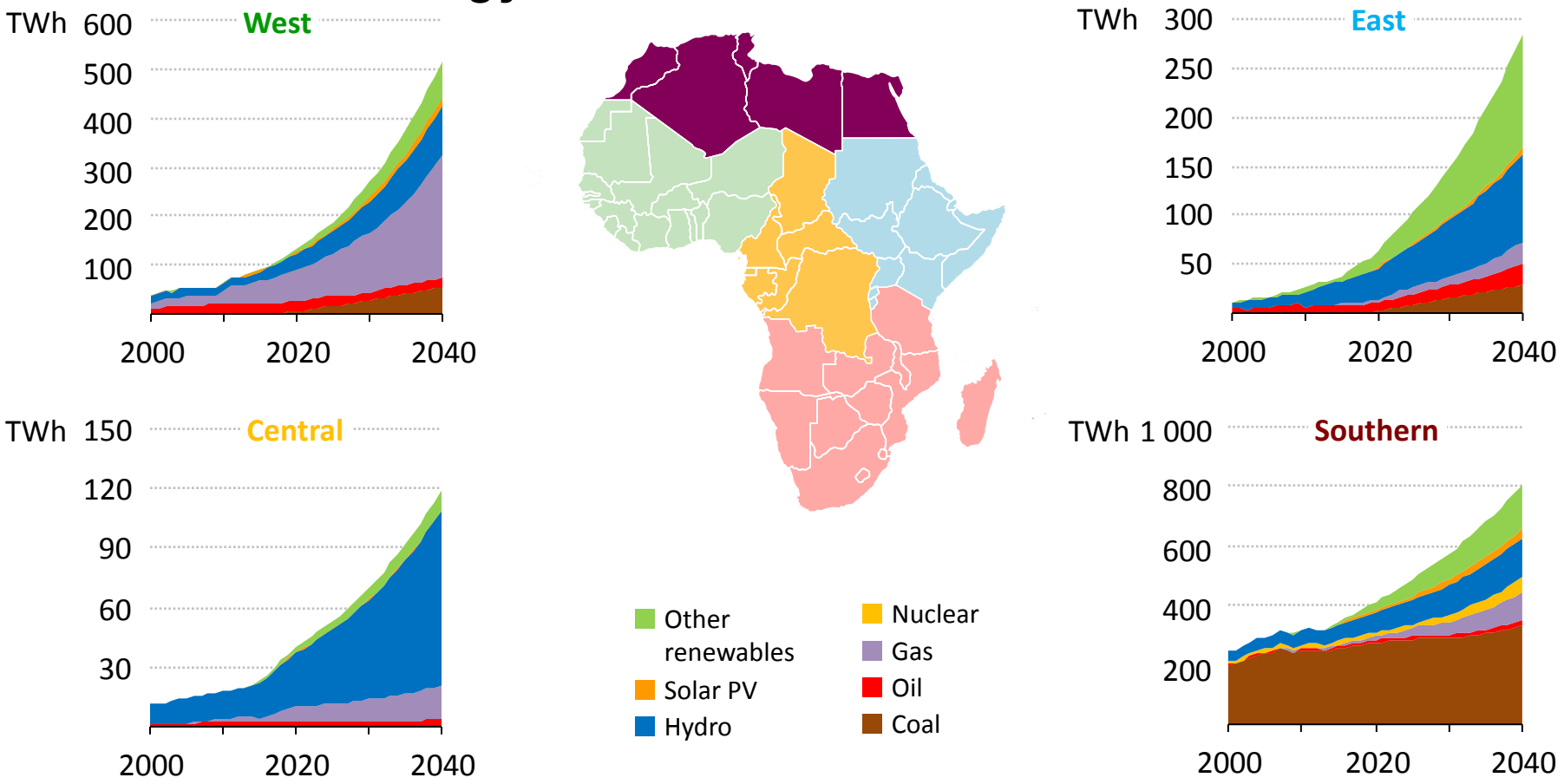
Relationship between Energy Access & Prosperity



Electricity Access Database, IEA WEO, 2013; McKinsey, 2015

Africa is rich in energy resource, yet poor in energy access

Energy Resource Potential in SSA



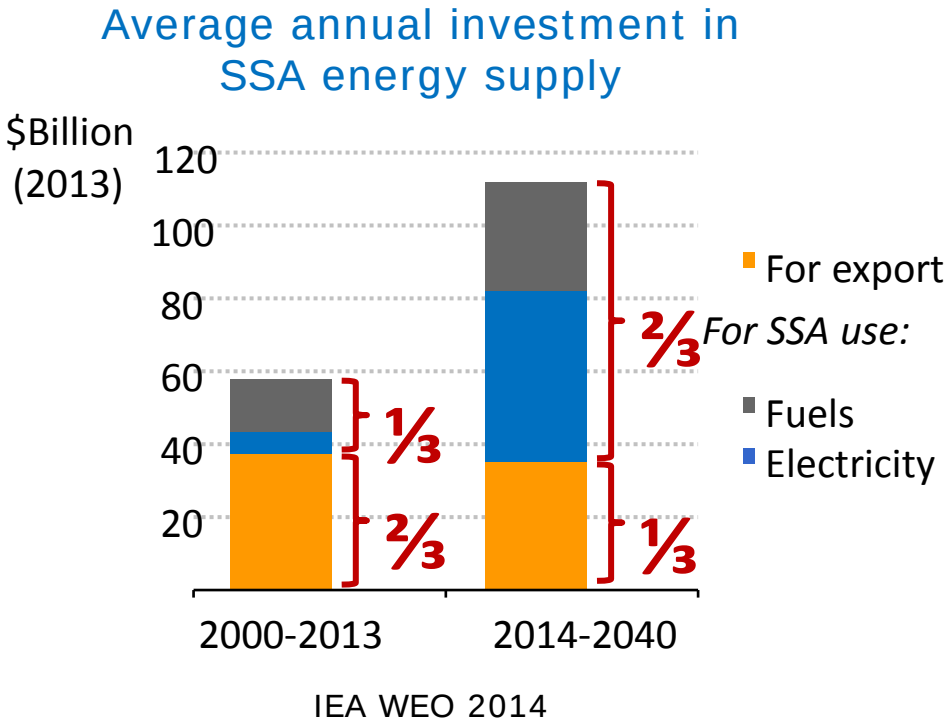
Source: IEA WEO 2014

The current '66 % - lack of access, energy investment situation'

- **66 %** of SSA population have no access to electricity

World Bank 2011

- **66 %** of energy investments in SSA are for export rather than internal utilization



IEA WEO 2014

Investment (US $ cummulative)

	Global		SSA
	Now	**Year 2040**	**Year 2040**
Energy Supply & Access	1.6 trillion	24 trillion	835 - 958 billion (for >70% energy access)
Energy Efficiency	130 – 310 billion	5-8 trillion	25 – 29 billion
McKinsey 2015; IEA WEO 2014; IEA Energy Efficiency Market Report 2014;			

- $40 billion in Energy Access capital savings from regionalization & power pooling (McKinsey, 2015)

Jobs & Economic Benefits from Energy Access – sub Saharan Africa (SSA)

- Estimated ~ **2.5 million jobs** (**direct**) by 2040 for achieving **70% Energy Access in SSA** (McKinsey, 2015)
  - **1.9 million jobs** construction of power plants (temporal but skills can be transferred to other construction or related industries afterwards)
  - **300,000 – 450, 0000** day-to-day operation and maintenance of the generation, transmission & distribution management
  - Increased jobs in the supply industries i.e. cement industry
- **Indirect**: value chain e.g. pipelines, rails etc)
- Additionally, **every $1** invested in Energy Access yields **>$15** in incremental GDP (IEA WEO, 2014)

Case example: Ghana

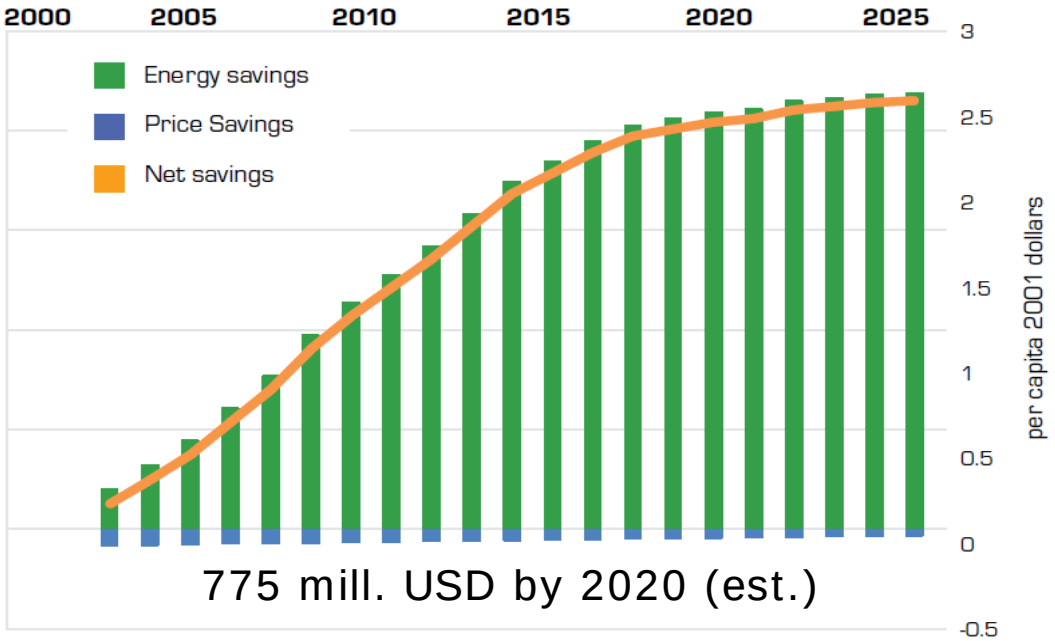
- Pre-1989, national electrification rate in Ghana was **15%** (rural access only 5%).
- 1989, Ghana launched the National Electrification Scheme (NES) targeted at universal access by 2020.

- The NES comprise of the:
  - District Capitals Electrification Programme (DCEP) targeted at grid extension to all District capitals
  - Self Help Electrification Programme (SHEP) to connect communities within 20km of an existing 33kV or 11kV sub-transmission line to the grid
- By 2011, Ghana recorded national electrification rate of **73%** (5-fold increase from 1989 level).
- Private sector was encouraged to support electricity generation which in 2001 led to Ghana's first IPP (Takoradi International Company, TICO) to generate 1040 GWh
- Similar experience by Egypt and Morocco. Eg. Morocco increased rural access from 18% (1995) to 96.5% by 2009 (via its PERG initiative).

Country Example: Ghana

Energy Efficiency – (a 'resource' seen in Ghana to complement national energy access drive) & savings

Ghana's room air conditioners



Source: CLASP 2015; Agyarko, 2014

Estimated cost savings/year for Ghana

- Room air conditioners – **30 mill. USD**
- Refrigerators – **72 mill. USD**
- CFLs – **39.5 mill. USD**
- **Additionally, 100 Jobs (2 CFL factories)**

- **Strong political will & target setting was a key driver**

Challenges for Energy for SD in Africa

A study by Brew-Hammond et al. (2014) revealed key reasons to be:

- The seemingly lack of a strong political will to bridge the rural-urban access gaps
  - however, with the SDG (7) and SEforAll, signs appear promising

- Lack of **well designed** and **implemented polices** targeted at strenthening the institutional structures to promote expanding energy access

- Lack of private sector involvement
  - Uncompetitive tariff regimes (enabling policies/framework are essential)
- Rural electrification and connecting the last mile
  - Decentralization of energy systems hold good promise
- Strengthening the existing grid

- Pioneering work by UNEP/UDP via GNESD (2014) shows that informal settlements in peri-urban communities (a considerable and ever growing population in developing countries) should also be considered

Concluding Recommendations

- Strong **political will** and **target setting** will drive Energy Access goals

- Reversing the 66% situation
- Strengthening the existing grid (to solve the reliability and quality issues)

- Increased regional integration and power pooling
- Decentralization of electrification schemes (especially for rural electrification and electrifying the last mile)

- Productive uses and enterprise development from energy access, to create wealth and reduce poverty

- Boosting investor confidence and access to finance (domestic, private, international)

- Energy efficiency has potential to enhance energy access (i.e. grid reliability, expansion). It should be considered as important energy RESSOURCE.

- Do not forget to electrify the informal settlements in peri-urban communities (GNESD 2014, GNESD 2008)

Thank you

Emmanuel Kofi Ackom, PHD
UNEP DTU Partnership (www.unepdtu.org)
Email: emac@dtu.dk;
emmanuel.kofi.ackom@gmail.com